What is claimed is:

1. A method for measuring an indication of attributes of materials containing a fluid state, the method comprising the steps of:

providing a time-domain signal indicative of attributes of said materials in a single measurement;

constructing a time-domain averaged data train from said signal, the averaging being performed over one or more time intervals Δ_i; and

computing an indication of attributes of said materials from the time-domain averaged data train.

2. The method of claim 1 wherein said one or more time intervals Δ_i are constant.

3. The method of claim 1 wherein at least two of said one or more time intervals Δ_i are different.

4. The method of claim 2 wherein the following expression is used to construct the time-domain averaged data train:

$$S_\Delta(t) = \int_t^{t+\Delta} dt' S(t') / \Delta$$

where $S_\Delta(t)$ is the provided time-domain signal.

5. The method of claim 1, wherein the interval Δ_i is fixed and the time-domain averaged data train is constructed at times $t = t_0, t_0 + \Delta, t_0 + 2\Delta, \ldots, t_0 + N\Delta$.

6. The method of claim 1, wherein the time-domain signal is an NMR echo train.

7. The method of claim 6, wherein the step of computing an indication of attributes is performed using inversion of the constructed time-domain averaged data train into T_2 domain.

8. The method of claim 7, wherein the T_2 distribution is estimated using the following expression

$$S_\Delta(t) = \sum_{T_2} \phi(T_2)\exp(-t/T_2)(1-\exp(-\Delta/T_2)) + Noise$$

where ϕ (T_2) is the porosity corresponding to the exponential decay time T_2.

9. The method of claim 1 further comprising the step of averaging two or more constructed time-domain averaged data trains to increase the signal-to-noise ratio (SNR) of the measurement.

10. A method for measuring an indication of attributes of materials containing a fluid state, comprising the steps of:

providing an NMR echo-train indicative of attributes of materials along the borehole;

constructing a time-domain averaged data train from said NMR echo train, the averaging being performed over one or more time intervals Δ_i; and

computing an indication of attributes of said materials from the time-domain averaged data train.

11. The method of claim 10 wherein said one or more time intervals Δ_i are constant.

12. The method of claim 10 wherein at least two of said one or more time intervals Δ_i are different.

13. The method of claim 10 further comprising the step of averaging two or more constructed time-domain averaged data trains to increase the signal-to-noise ratio (SNR) of the measurement.

14. The method of claim 10 wherein the following expression is used to construct the time-domain averaged data train:

$$Echo_{\Delta}(t) = \int_{t}^{t+\Delta} dt' \, Echo(t') / \Delta$$

where $Echo_{\Delta}(t)$ is the provided time-domain signal over a time interval Δ_i.

15. The method of claim 10, wherein the time interval Δ_i is constant and the time-domain averaged data train is constructed at times $t = t_0, t_0 + \Delta, t_0 + 2\Delta, \ldots, t_0 + N\Delta$.

16. The method of claim 15, wherein the step of computing an indication of attributes is performed using inversion of the constructed time-domain averaged data train into T_2 domain.

17. The method of claim 16, wherein the T_2 distribution is estimated using the following expression

$$Echo_{\Delta}(t) = \sum_{T_2} \phi(T_2) \exp(-t / T_2)(1 - \exp(-\Delta / T_2)) + Noise$$

where ϕ (T_2) is the porosity corresponding to the exponential decay time T_2.

18. A method for increasing the spatial resolution of NMR logging measurements, comprising the steps of:

providing an NMR echo-train indicative of attributes of materials of interest; and

constructing a time-domain averaged data train from said NMR echo train, the averaging being performed over one or more time intervals Δ_i.

19. The method of claim 18 wherein said one or more time intervals Δ_i are constant.

20. The method of claim 18 wherein at least two of said one or more time intervals Δ_i are different.

21. The method of claim 18further comprising the step of averaging two or more constructed time-domain averaged data trains to increase the signal-to-noise ratio (SNR) of the measurement.

22. The method of claim 18 wherein the following expression is used to construct the time-domain averaged data train:

$$Echo_{\Delta}(t) = \int_{t}^{t+\Delta} dt' \, Echo(t') / \Delta$$

where $Echo_{\Delta}(t)$ is the provided time-domain signal.

23. The method of claim 18 wherein the time interval Δ_i is constant and the time-domain averaged data train is constructed at times $t = t_0, t_0 + \Delta, t_0 + 2\Delta, \ldots, t_0 + N\Delta$.

24. The method of claim 23, wherein the step of computing an indication of attributes is performed using inversion of the constructed time-domain averaged data train into T_2 domain.

25. The method of claim 24wherein the T_2 distribution is estimated using the following expression

$$Echo_{\Delta}(t) = \sum_{T_2} \phi(T_2)\exp(-t / T_2)(1 - \exp(-\Delta / T_2)) + Noise$$

where ϕ (T_2) is the porosity corresponding to the exponential decay time T_2.

26 A method for real-time processing of NMR logging signals, comprising the steps of:

providing real-time data corresponding to a single-event NMR echo train indicative of physical properties of materials of interest;

constructing a time-domain averaged data train from said NMR echo train, the averaging being performed over time interval Δ using the expression

$$S_{\Delta}(t) = \int_{t}^{t+\Delta} dt' S(t') / \Delta$$

where $S(t)$ is the provided measurement signal, and the time-domain averaged data train is constructed at times $t = t_0, t_0 + \Delta, t_0 + 2\Delta, \ldots, t_0 + N\Delta$; and

computing in real time an indication of the physical properties of said materials based on the constructed time-domain averaged data train.

27. The method of claim 26, further comprising the step of

inverting of the constructed time-domain averaged data train into the T_2 domain, wherein the T_2 distribution is modeled using the expression

$$Echo_{\Delta}(t) = \sum_{T_2} \phi(T_2)\exp(-t / T_2)(1 - \exp(-\Delta / T_2)) + Noise$$

where ϕ (T_2) is the porosity corresponding to the exponential decay time T_2.

28. The method of claim 26, further comprising the step of averaging two or more constructed time-domain averaged data trains to increase the signal-to-noise ratio (SNR) of the measurement.